

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently amended): A ~~modified GPCR comprising amino acids from an amino acid sequence of a first GPCR and amino acids from a second GPCR, wherein the amino acids from the second GPCR are fused to the amino acids of the first GPCR to yield a modified GPCR, modified by substitution of a carboxyl terminal tail portion of the first GPCR with a carboxyl terminal tail portion from a different GPCR, the substitution located downstream of an NPXXY (SEQ ID NO:82) motif of the first GPCR,~~

~~wherein the amino acids from the first GPCR comprise an NPXXY motif (SEQ. ID NO.: 82)~~

~~wherein the carboxyl terminal tail portion of amino acids from the second different GPCR comprises one or more clusters of phosphorylation sites, and~~

~~wherein the modified GPCR further comprises a putative site of palmitoylation; wherein the putative site of palmitoylation is 10 to 25 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82).~~

Claim 2 (Currently amended): The ~~modified GPCR~~ of Claim 1, wherein the first GPCR is a Class A receptor.

Claim 3 (Currently amended): The ~~modified GPCR~~ of Claim 1, wherein the first GPCR is an olfactory receptor or a taste receptor.

Claim 4 (Currently amended): The ~~modified GPCR~~ of Claim 2, wherein the ~~different second~~ GPCR is a Class B receptor.

Claim 5 (Currently amended): The ~~modified GPCR~~ of Claim 4, wherein the Class B receptor is selected from the group consisting of a vasopressin V2 receptor, a neuropeptid-1 receptor, a substance P receptor and an oxytocin receptor.

Claim 6 (Currently amended): The ~~modified~~ GPCR of Claim 5, wherein the Class B receptor is a vasopressin V2 receptor.

Claim 7 (Canceled).

Claim 8 (Currently amended): The ~~modified~~ GPCR of Claim 1, wherein the one or more clusters of phosphorylation sites are 20 to 55 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82).

Claim 9 (Currently amended): The ~~modified~~ GPCR of Claim 8, wherein the one or more clusters of phosphorylation sites are 30 to 45 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82).

Claim 10 (Currently amended): The ~~modified~~ GPCR of Claim 1, wherein the one or more clusters of phosphorylation sites are 15 to 35 amino acid residues downstream of the putative site of palmitoylation.

Claim 11 (Currently amended): The ~~modified~~ GPCR of Claim 10, wherein the one or more clusters of phosphorylation sites are 15 to 25 amino acid residues downstream of the putative site of palmitoylation.

Claims 12-14 (Canceled).

Claim 15 (Currently amended): The ~~modified~~ GPCR of Claim 1, wherein the GPCR has an amino acid sequence selected from the group consisting of comprising a polypeptide with the amino acid sequence of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3, SEQ ID NO:4, SEQ ID NO:5, or SEQ ID NO:6, SEQ ID NO:7, and SEQ ID NO:8.

Claim 16 (Currently amended): A ~~modified~~ GPCR comprising an amino acid sequence of amino acids from a first GPCR and amino acids from a second GPCR, wherein amino acids from the second GPCR are fused to the first GPCR to yield a modified GPCR, modified by substitution of a carboxyl terminal tail portion of the first GPCR with a carboxyl

terminal tail portion from a different GPCR, the substitution located downstream of an NPXXY (SEQ ID NO:82) motif of the first GPCR,
wherein the amino acids from the first GPCR comprise an NPXXY motif (SEQ. ID NO.: 82),
wherein the carboxyl terminal tail portion of amino acids from the second different GPCR comprises one or more clusters of phosphorylation sites,
wherein the modified GPCR further comprises a putative site of palmitoylation,
wherein the putative site of palmitoylation is 10 to 25 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82), and
wherein the modified GPCR is conjugated to a detectable detectable molecule.

Claim 17 (Currently amended): An isolated nucleic acid encoding a modified GPCR, wherein the modified GPCR comprises an amino acid sequence of amino acids from a first GPCR and amino acids from a second GPCR, wherein amino acids from the second GPCR are fused to the first GPCR to yield a modified GPCR, modified by substitution of a carboxyl terminal tail portion of the first GPCR with a carboxyl terminal tail portion from a different GPCR, the substitution located downstream of an NPXXY (SEQ ID NO:82) motif of the first GPCR,

wherein the amino acids from the first GPCR comprise an NPXXY motif (SEQ. ID NO.: 82),
wherein the carboxyl terminal tail portion of amino acids from the second different GPCR comprises one or more clusters of phosphorylation sites, and
wherein the modified GPCR further comprises a putative site of palmitoylation,
wherein the putative site of palmitoylation is 10 to 25 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82).

Claim 18 (Currently amended): An expression vector comprising an isolated nucleic acid encoding a modified GPCR, wherein the modified GPCR comprises an amino acid sequence of amino acids from a first GPCR and amino acids from a second GPCR, wherein amino acids from the second GPCR are fused to the first GPCR to yield a modified GPCR, modified by substitution of a carboxyl terminal tail portion of the first GPCR with a carboxyl terminal tail portion from a different GPCR, the substitution located downstream of an NPXXY (SEQ ID NO:82) motif of the first GPCR,

wherein the amino acids from the first GPCR comprise an NPXXY motif (SEQ. ID NO.: 82),

wherein the carboxyl terminal tail portion of amino acids from the second different GPCR comprises one or more clusters of phosphorylation sites,

wherein the modified GPCR further comprises a putative site of palmitoylation, wherein the putative site of palmitoylation is 10 to 25 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82), and

wherein the nucleic acid is operably linked to an expression control sequence.

Claim 19 (Currently amended): A host cell comprising an expression vector comprising an isolated nucleic acid encoding a modified GPCR, wherein the modified GPCR comprises an amino acid sequence of amino acids from a first GPCR and amino acids from a second GPCR, wherein amino acids from the second GPCR are fused to the first GPCR to yield a modified GPCR, modified by substitution of a carboxyl terminal tail portion of the first GPCR with a carboxyl terminal tail portion from a different GPCR, the substitution located downstream of an NPXXY (SEQ ID NO:82) motif of the first GPCR,

wherein the amino acids from the first GPCR comprise an NPXXY motif (SEQ. ID NO.: 82),

wherein the carboxyl terminal tail portion of amino acids from the second different GPCR comprises one or more clusters of phosphorylation sites,

wherein the modified GPCR further comprises a putative site of palmitoylation, wherein the putative site of palmitoylation is 10 to 25 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82), and

wherein the nucleic acid is operably linked to an expression control sequence.

Claim 20 (Currently amended): A modified GPCR comprising a an amino acid sequence of a first GPCR modified by substitution of a carboxyl terminal tail portion of the first GPCR with a carboxyl terminal tail portion from a different GPCR, the substitution located adjacent to a putative site of palmitoylation of the first GPCR, NPXXY motif (SEQ. ID NO.: 82) and a carboxyl terminal tail,

wherein the carboxyl terminal tail portion of the different GPCR comprises a putative site of palmitoylation and one or more clusters of phosphorylation sites, and

~~wherein the carboxyl terminal tail comprises a retained portion of a carboxyl terminus region of a first GPCR portion fused to a polypeptide,~~

~~wherein the polypeptide comprises the one or more clusters of phosphorylation, and~~

~~wherein the retained portion of the first GPCR and the polypeptide are fused at an amino acid residue adjacent to the putative site of palmitoylation.~~

wherein the putative site of palmitoylation of the first GPCR is 10 to 25 amino acid residues downstream of an NPXXY motif (SEQ. ID NO.: 82) of the first GPCR.

Claim 21 (Canceled).

Claim 22 (Currently amended): The ~~modified~~ GPCR of claim 20, wherein the first GPCR is a Class A receptor.

Claim 23 (Currently amended): The ~~modified~~ GPCR of claim 21 20, wherein the ~~second~~ different GPCR is a Class B receptor.

Claim 24 (Currently amended): The ~~modified~~ GPCR of Claim 20, wherein the one or more clusters of phosphorylation sites are 20 to 55 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82).

Claim 25 (Currently amended): The ~~modified~~ GPCR of Claim 20, wherein the one or more clusters of phosphorylation sites are 15 to 35 amino acid residues downstream of the putative site of palmitoylation.

Claim 26 (Currently amended): A ~~modified~~ GPCR comprising an amino acid sequence of a first GPCR modified by substitution of a carboxyl terminal tail portion of the first GPCR with a carboxyl terminal tail portion from a different GPCR, the substitution located adjacent to a putative site of palmitoylation of the first GPCR, the putative site of palmitoylation being a cysteine residue, a NPXXY motif (SEQ. ID NO.: 82) and a carboxyl terminal tail,

wherein the said carboxyl terminal tail portion of the different GPCR comprises a palmitoylated cysteine residue and one or more clusters of phosphorylation sites, and

wherein the carboxyl terminal tail comprises a retained portion of a

~~carboxyl terminus region of a first GPCR portion fused to a portion of a carboxyl terminus from a second GPCR, and~~

~~wherein said second GPCR comprises the one or more clusters of phosphorylation, and~~

~~wherein the retained portion of said first GPCR and said second GPCR are fused at an amino acid residue adjacent to the palmitoylated cysteine residue.~~

wherein the putative site of palmitoylation of the first GPCR is 10 to 25 amino acid residues downstream of an NPXXY motif (SEQ. ID NO.: 82) of the first GPCR.

Claim 27 (Currently amended): The ~~modified GPCR~~ of claim 26, wherein the first GPCR is a Class A receptor and the different second GPCR is a Class B receptor.

Claim 28 (Currently amended): The ~~modified GPCR~~ of claim 27, wherein the ~~retained portion ends with the palmitoylated cysteine residue and the second GPCR amino acid sequence of the first GPCR is modified by substitution of the carboxyl terminal tail portion of the first GPCR with the carboxyl terminal tail portion from the different GPCR at~~ begins with an amino acid residue immediately downstream of the palmitoylated cysteine residue.

Claim 29 (Currently amended): The ~~modified GPCR~~ of Claim 27, wherein the one or more clusters of phosphorylation sites are 20 to 55 amino acid residues downstream of the NPXXY motif (SEQ. ID NO.: 82).

Claim 30 (Currently amended): The ~~modified GPCR~~ of Claim 27, wherein the one or more clusters of phosphorylation sites are 15 to 35 amino acid residues downstream of the putative site of palmitoylation.

Claims 31-39 (Canceled).